

1. MALEYNOV, A. A.; TUSHINSKIY, G. K.
2. USSR (600)
4. Geology and Geography
7. Travels in the Mountains, A. A. Maleynov, and G. K. Tushinskiy.  
(Moscow, Geography Press, 1950). Reviewed by N. A. Gvozdetskiy,  
Sov. Kniga, No. 9, 1951.
9. Report U-3081, 16 Jan. 1953. Unclassified.

TUSHINSKIY, G.K.; GUS'KOVA, Ye.F.; GUBAREVA, V.D.

[Snow recrystallization and the formation of avalanches] Pere-kristallizatsiya snega i vozniknovenie lavin. [Moskva] Izd-vo Moskovskogo univ., 1953. 114 p. (MIRA 9:10)  
(Snow) (Avalanches)

TUSHINSKY, G. K., GUS'KOVA, YE. F., AND GUBAREVA, V. D.

Recrystallization of Snow and the Occurrence of Avalanches

The authors expound a procedure for and results of investigations into snow thicknesses of avalanche-dangerous portions for clarifying the processes governing the formation of weakly bound horizons of snow firms and deep hoarfrost forming dangerous horizons of sliding. On experimental areas under natural condition they studied the temperature regime for 2 years, migration of water vapor, and changes in microstructure of the snow. They set up special experiments for studing the process of firnization of newly fallen snow and the evolution of bonds between the crystals by means of observations during the changes occurring in the same crystals over a period of several months. The results of the works showed the inescapableness of recrystallization of the snow thickness with course of time and confirmed earlier recommendations. (RZhGeol, No. 4, 1955) Uch. zap. Mosk. gor. pad. in-ta, 21, 1953, 43-69

SO: Sum. No. 744, 8 Dec 55 - Supplementary Survey of Soviet Scientific Abstracts (17)

TUSHINSKIY, G. K.

BORZOV, A. A.; PETUKHOV, A. J.; GVOZDITSKIY, N. A., redaktor; DIK, N. Ye.,  
redaktor; SOLOV'YEV, A. I., redaktor; TUSHINSKIY, G. K.; redaktor;  
KOSTINISKIY, D. N., redaktor; KOSHELEVA, S. M., tekhnicheskij redaktor

[Geographical works] Geograficheskie raboty. 2-e, ispr. izd. Moskva,  
Gos. izd-vo Geograf. lit-ry, 1954. 523 p. (MIRA 8:4)  
(Physical geography) (Geography--Study and teaching)

TUSHINSKIY, G.K.

SIMONOV, Ye.D., redaktor; ROTOTAYEV, P.S., redaktor; BOROVIKOV, A.M.,  
redaktor; BULGAKOV, N.V., redaktor; GARF, B.A., redaktor, GVOZDETSKIY,  
N.A., redaktor; YEZERSKIY, Ye.M., redaktor; ZATULOVSKIY,  
D.M., redaktor; IVANOV, A.I., redaktor; KUZMIN, K.K., redaktor;  
NESTEROV, V.F., redaktor; SUSLOV, A.D., redaktor; TUSHINSKIY, G.K.,  
redaktor; YUKHIN, I.V., redaktor; LEBEDEVA, N.G., redaktor; UOMI  
TSYN, A.V., redaktor; KOSHKELEVA, S.M., tekhnicheskiy redaktor

[Conquered peaks; annual publication of Soviet mountaineering for  
1953] Pobezhdennye vershiny; ezhegodnik sovetskogo alpinizma  
god 1953. Moskva, Gos. izd-vo geograficheskoi lit-ry, 1954. 606 p.  
(Mountaineering--Yearbooks) (MIRA 8:7)

TUSHINSKIY, G. K.

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No. 22-40, 20 Feb - 3 Apr 1954)

<u>Name</u>	<u>Title of Work</u>	<u>Nominated by</u>
Tushinskiy, G. K.	"Avalanches. Their Formation and Protection From Them" "Travels in the Mountains" "Recrystallization of Snow and the Formation of Avalanches"	Moscow State University imeni M. V. Lomonosov

SO: W-30604, 7 July 1954

TUSHINSKIY, G. K.  
USSR/Geophysics - Geographers

FD-688

Card 1/1 : Pub. 129 - 23/25

Author : Kibal'chich, O.

Title : Lomonosov lectures, 22-26 April 1954, in the Geographic Faculty

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, Vol. 9, No.3,  
155-158, May 1954

Abstract : Prof. P. N. Stepanov, "Experience gained in the work of the 'Ural' Study [Kabinet] of the Chair of USSR Economic Geography. "Docent I. M. textbooks on economic geography of Hungary and Czechoslovakia." Prof. A. G. Voronov, "Principles governing the construction of collections on biogeography and their use in the preparation of geographers." Prof. G. K. Tushinskiy, "Development of stands and exhibits at museums." Prof. I. S. Shchukin, "Development of geomorphology in Moscow University." Prof. N. N. Zubov "theory of the regime of channels and lakes in air regions." Docent A. F. Miroshnuchenko, "Experience gained in compiling complex maps of natural conditions in territories utilized by Kolkhozes."

Institution : --

Submitted : --

TUSHINSKIY, G.K., red.; PONOMARENKO, A.A., tekhn. red.

[Programs of pedagogical institutes; summer field work for geography faculties] Programmy pedagogicheskikh institutov; letnaya polevaia praktika dlia geograficheskikh fakul'tetov. [Moskva] Uchpedgiz, (MIRA 11:9)  
1955. 31 p.

1. Russia (1917- R.S.F.S.R.) Glavnoye upravleniye vysshikh i srednikh pedagogicheskikh uchebnykh zavedeniy.  
(Geography—Study and teaching)

ZABIROV, Rashit Dzhamaliyevich; ASOYAN, N.S., redaktor; TUSHINSKIY, G.K.,  
professor, doktor geograficheskikh nauk, redaktor; KIVINA, I.N.,  
tekhnicheskiy redaktor

[Glaciation of Pamira] Oledenenie Pamira. Moskva, Gos. izd-vo  
geograficheskoi lit-ry, 1955. 370 p.  
(MIRA 8:7)  
(Pamira--Physical geography)

DAVYDOVA, M.I.; KAMINSKIY, A.I.; TUSHINSKIY, G.K.; VASIL'YENVA, O.S.,  
redaktor; CHUVALDIN, A.M., redaktor kart; MAKHOVA, N.N., tekhnicheskiy  
redaktor

[Physical geography of the U.S.S.R.; practical exercises] Fizicheskaiya geografija SSSR; prakticheskie raboty. Moskva, Gos. uchebno-pedagog. izd-vo Ministerstva prosveshchenija RSFSR, 1956. 162 p.  
20 fold.maps. (MLRA 10:2)

(Physical geography)

14-57-7-14927  
Translation from: Referativnyy zhurnal, Geografiya, 1957, Nr 7,  
p 120 (USSR)

AUTHOR: Tushinskiy, G. K.

TITLE: Means of Preventing Avalanches (Meropriyatiya po  
bor'be s lavinami)

PERIODICAL: V sb: Vopr. ispol'zovaniya snega i bor'ba so snezh.  
zanosami i lavinami, Moscow, 1956, pp 156-166

ABSTRACT: The author points out that construction sites cannot  
be properly selected and all-year roads cannot be  
built in newly opened mountainous regions until re-  
connaissance work and exploratory studies of means for  
preventing avalanches have been undertaken. He  
presents a table which classifies different kinds of  
avalanches, and he emphasizes the necessity of taking  
classification features into consideration when  
studying the danger of avalanches and means for

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14-57-7-14927

Means of Preventing Avalanches (Cont.)

preventing them. He discusses unusual relief formations produced by avalanches, such as runoff canals, fans, hillocks, layers of clastic material, and lateral pseudomoraines. In addition to these relief forms, avalanches produce a special type of rock consisting of assorted clastic material. The author also shows that avalanches affect vegetation in two different ways; they destroy certain kinds of trees and alter the components of vegetation associations. Exploratory studies should center on locating dangerous areas in order to devise acceptable measures for preventing avalanches and to acquire data which would help in designing preventive structures. The TNIS [Tbilisskiy n.-i. in-t sooruzheniy, (Tiflis Scientific Structural Institute)] formula is recommended for determining the speed at which avalanches move and the resulting force with which they strike at any point on a slope. The author describes various means for combating avalanches. He discusses preventive measures, such as the use of patrols and warning systems, deliberate destruction of avalanches, and application of various engineering

Card 2/3

14-57-7-14927

Means of Preventing Avalanches (Cont.)

techniques. Some of these are: warning systems, packing of snow in avalanche deflectors (stone walls and wooden shields); prevention of snow slides on slopes by planting trees, use of intercepting ditches with embankment, use of terraces, retaining walls, and wooden shields; the ways of deflecting avalanches by dykes and dams, and of directing avalanches over the structures protected by roofs and galleries. The author maintains that a state inspection system must be organized to plan the construction of buildings and roads in the mountains and to see that plans are carried out.

Card 3/3

A. T.

TUSHINSKIY, G.K.

VASIL'YEVA, I.V., dots.; DAVYDOVA, M.I., dots.; KAMENSKIY, A.I., dots.;  
KOTEL'NIKOV, V.L., dots.; TUSHINSKIY, G.K., prof.; YATSENKO, A.A.,  
dots.; KREYS, I.G., tekhn.red.; SHCHEPTEVA, T.A., tekhn.red.

[Programs of pedagogical institutes; physical geography of the  
U.S.S.R.] Programmy pedagogicheskikh institutov; fizicheskaya  
geografiia SSSR. [Moskva] Uchpedgiz, 1957. 22 p. (MIRA 11:3)

1. Russia (1917- R.S.F.S.R.) Glavnoye upravleniye vysshikh i  
srednikh pedagogicheskikh uchebnykh zavedenii.  
(Physical geography--Study and teaching)

TUSHINSKIY, G.K., prof.; AVSYUK, G.A., prof., otvetstvennyy red.; PAVLOVA, Ye.P.,  
red.

[No.6. Studying the snow cover; no.7. Observations on firns; No.8.  
Observing avalanches; No.9. Observing snow transport by snowstorms]  
No.6. Izuchenie snezhnogo pokrova; No. 7. Nabliudeniia na snezhnikakh;  
No.8. Nabliudenii za lavinami; No.9. Nabliudeniia za metelevym  
perenosom snega. Moskva, 1957 63 p. (Osnovnye metodicheskie ukazaniia  
po gliatsiologicheskim issledovaniiam) (MIRA 11:9)  
(Snow)

TUSHINSKIY, G.K., prof.; AVSYUK, G.A., prof., red.; PAVLOVA, Ye.P., red.

[Fundamentals of safety techniques in carrying out glaciological research] Osnovy tekhniki bezopastnosti pri provedenii gliatsiologicheskikh issledovanii, Moskva, 1957. 21 p. (Osnovnye metodicheskie ukazaniia po gliatsiologicheskim issledovaniam, no. 12) (Glaciers) (MIRA 11:7)

TUSHINSKIY Georgiy Kazimirovich; SKVORTSOV, V.P., red.; AVERKIYEVA, T.A.,  
tekhn.red.

[Avalanches and protection from them during geological prospecting]  
Leviny i zashchita ot nich na geologo-razvedochnykh rabotakh.  
Moskva, Gos.suchno-tekhn.izd-vo lit-ry po geol. i okhrane nedr,  
1957. 107 p.  
(Avalanches)

TUSHINSKIY, G.K.

BUNDEL', A.A., red.; GIPPENREYTER, B.Ye., red.; GVOZDETSKIY, N.A., red.;  
GREKOV, L.I., red.; KUZ'MIN, K.K., red.; LETAVET, A.A., red.;  
MEMYTSKIY, V.V., red.; ROTOTAYEV, P.S., red.; SIMONOV, Ye.D., red.;  
TUSHINSKIY, G.K., red.; YUKHIN, I.V., red.; DOBRONRAVOVA, K.O., red.;  
GLEIKH, D.A., tekhn.red.; MAL'CHEVSKIY, G.N., red. kart.

[Conquered peaks of 1954; a yearbook of Soviet mountaineering]  
Pobezhdennye vershiny god 1954; ezhegodnik sovetskogo alpinizma.  
[Moskva] Gos.izd-vo geogr.lit-ry, 1957. 431 p. (MIRA 11:1)  
(Mountaineering--Yearbooks)

TUSHINSKIY, G.K.

3(3,4) P.2, P.4

PHASE I BOOK EXPLOITATION

sov/2355

Moscow. Universitet. Geograficheskiy fakul'tet.

Informatsionnyy sbornik o rabotakh Geograficheskogo fakul'teta Moskovskogo gosudarstvennogo universiteta po Mezhdunarodnomu geofizicheskому godu, No 1 (Collection of Information on Work Done by the Geography Department of Moscow University for the International Geophysical Year, Nr 1) Moscow, 1958. 298 p. Errata slip inserted, 800 copies printed.

Resp. Ed.: G. K. Tushinskiy, Professor

PURPOSE: This book is intended for earth scientists, particularly those interested in glacial phenomena.

COVERAGE: This book describes the activities of the Geography Department of Moscow State University in connection with International Geophysical Year. The work is divided into 4 parts, each dealing with a specific regional expedition. These are: the Mount Elbrus Expedition, the Khibiny Expedition, the Pamir Expedition, and the Antarctic Expedition. Additional articles discuss problems in glaciology and research techniques. References accompany each article.

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Collection of Information on Work Done by the (Cont.) Sov/2355

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THE I.G.Y. PAMIR EXPEDITION

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THE I.G.Y. ANTARCTIC EXPEDITION

Card 3/5

Collection of Information on Work Done by the (Cont.) SOV/2355

Kapitsa, A.P. Preliminary Results of the Seismographic Sounding of the Antarctic Snow Cover During the First Soviet Antarctic Expedition of the Academy of Sciences, USSR, 1955-57

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GENERAL PROBLEMS OF GLACIOLOGY AND THE STUDY OF PERMAFROST

Popov, A.I. The Glacial-Geological Zoning of the Permafrost Area in the USSR

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RESEARCH METHODS

Krenke, A.N., and Ye.S. Troshkina. Method of Collecting Ice Samples for the Spore-Pollen Analysis

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Kapitsa, A.P. Mechanical Drilling of a Freshwater Firm

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Ryabtseva, K.M., and G.K. Tushinskiy. Stratigraphy of Snow as an Indicator of the Characteristics of Natural Region Complexes

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Card 4/ 5

Collection of Information on Work Done by the (Cont.) Sov/2355

Shcherbakova, Ye.M. Information Table for Traces of Ancient  
Glaciation in Mountains

284

REPORTS

Troshkina, Ye.S. Study of the Physical Properties of Snow and of  
the Metamorphic Process in a Snow Cover

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AVAILABLE: Library of Congress

Card 5/5

MM/fal  
9-18-59

TUSHINSKII, G.K.

Program and methods of studying snow thickness in order to forecast  
the approach of avalanche danger. Trudy Tbil. NIGMI no.3:118-127  
'58. (MIRA 11:10)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.  
(Snow)

TUSHINSKIY, G.K.; SULAKVELIDZE, G.K.

Glaciological research on Mount Elbrus. Mezhdunar. geodiz. god  
no.5:56-63 '58. (MIRA 11:10)  
(Elbrus, Mount--Glaciers)

TUSHINSKII, G.K.; TYABTSEVA, K.M.

The International Geophysical Year. Geog. v shkole 21 no. 1:1-14  
Ja-F '58. (MIRA 11:?)  
(International Geophysical Year, 1957-1958)

TUSHINSKIY, G.K.

Rhythm in the glaciation and snow dynamics of Caucasus. Vest.  
Mosk.un.Ser.5: Geog. 15 no.1:31-36 '60. (MIRA 13:8)

1. Kafedra obshchego zemlevedeniya Moskovskogo universiteta.  
(Caucasus--Glaciers) (Caucasus--Snow)

TUSHINSKIY, G. K.

*"Present-Day Glaciation of the Caucasus and Its Dynamics"*

report to be submitted for the Intl. Geographical Union, 10th General Assembly  
and 19th Intl. Geographical Congress, Stockholm, Sweden, 6-13 August 1960.

TUSHINSKIY, Georgiy Kazimirovich, prof., doktor geograf.nauk. Prinimal  
uchastiye RUDAKOV, L.M., BYALOBZHESKIY, G.V., red.; CHVANOV,  
V.O., red.izd-va; DONSKAYA, G.D., tekhn.red.

[Protecting highways from snow slides] Zashchita avtomobil'nykh  
dorog ot lavin. Moskva, Nauchno-tekhn.izd-vo M-va avtomobil'nogo  
transp. i shosseinykh dorog RSFSR, 1960. 152 p. (MIRA 13:5)

1. Moskovskiy gosudarstvennyy universitet (for Rudakov). 2. Gosu-  
darstvennyy vsesoyuznyy dorozhnyy nauchno-issledovatel'skiy in-  
stitut (SOYUZDORNII) (for Byalobzheskiy).  
(Roads--Snow protection and removal)

SOV/3-59-5-24/34

22(1)

AUTHORS: Davydova, M.I., and Kamenskiy, A.I., Candidates of Geographical Sciences; Docents; Tushinskiy, G.K. Doctor of Geographical Sciences, Professor.

TITLE: Practical Field Training in Physical Geography

PERIODICAL: Vestnik vysshey shkoly, 1959, Nr 5, pp 78 - 79  
(USSR)

ABSTRACT: The basic purpose of practical field training is to assimilate the methods of thoroughly conducted geographical research and to estimate the natural resources and possibilities of their utilization on a specific territory. The natural-geographical and geographical departments of pedagogical institute conduct practical field training in physical geography during the first 4 years. The author describes the task given to students of the 4 years which results in working out a detailed geographic characteristic of the specific territory, drawing up a landscape chart with a detailed explanation.

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SOV/3-59-5-24/34

Practical Field Training in Physical Geography

In 1955, the Ministerstvo prosveshcheniya RSFSR (Ministry of Education RSFSR) approved a program of practical field training in summer for third year students which is carried out by the various pedagogical institutes in a different way for lack of information on the content and methods to be adopted. The Geographical Department of the Moscow City Pedagogical Institute has been convinced by experience that it is best to conduct practical field training on a comparatively small territory. It should, however, visually demonstrate the most important regularities of structure of the geographical surrounding and the intercommunication between the individual elements of nature and economy. The geographical and biologic-geographical stations of vuzes comply with these demands. The author outlines how research could be developed if the stations are well equipped, stating that

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Practical Field Training in Physical Geography.

a concluding scientific-methodological conference  
should be the final stage of a practical field  
training.

ASSOCIATION: Moskovskiy gorodskoy pedagogicheskiy institut  
imeni V.P. Potemkina (Moscow City Pedagogical  
Institute imeni V.P. Potemkin)

Card 3/3

SUKACHEV, V.N.; BOGDANOV, A.A.; IVANOVA, I.K.; LAZUKOV, G.I.; NIKOLAYEV, N.I.;  
YAKUSHOVA, A.F.; GELLER, S.Yu.; GRICHUK, V.P.; KOLESNIK, S.V.;  
SOKOLOV, N.N.; LICHKOV, B.L.; GORETSKIY, G.I.; SHCHUKIN, I.S.;  
BYKOV, V.D.; SAUSHKIN, Yu.G.; GLAZOVSKAYA, M.A.; GOVDETSKIY, N.A.;  
TUSHINSKIY, G.K.

Konstantin Konstantinovich Markov's role in the creation and development of the paleogeography of the anthropogenic (the Quaternary) period; on his 60th birthday and the 40th anniversary of scientific work. Izv. Vses. geog. ob-va 97 no.4:377-379 Jl-Ag '65. (MIRA 18:8)

AKIF'YEVA, K. V.; BELINSKIY, V. A.; BIRFUKHANOV, A. V.; VLADIMIROVA,  
G. A.; MAKHOVA, Yu. V.; MALINOVSKAYA, N. M.; MIAGKOV, S. M.;  
NORMAN, E. A.; SEMEKHIN, Yu. V.; TARASOV, G. K.; TUSHINSKIY,  
G. K.; UTYAKOV, P. A.; FAMINTSYN, B. M.; SHATERNIKOVA, I. S.;  
SHAMSHIYEV, K. M.

Estimation of the danger of avalanches in high mountain areas  
designated for development. Inform. sbor. o rab. Geog. fak.  
Mosk. gos. un. po. Mezhdunar. geofiz. godu no.8:27-163 '62.  
(MIRA 16:1)

(Caucasus—Avalanches)

AVSYUK, G.A.; GRAVE, N.A.; KOTLYAKOV, V.M.; PESCHANSKIY, I.S.;  
TUSHINSKIY, G.K.

[Report on research in glaciology, 1960-1962; presented  
to the International Association of Hydrology and the  
International Snow and Ice Commission for the 13th General  
Assembly of the International Union of Geodesy and Geo-  
physics] Soobshchenie o nauchnykh rabotakh po gliatsio-  
logii, 1960-1962 gg.; predstavliaetsia v Mezhdunarodnuiu  
assotsiatsiu nauchnoi hidrologii i Mezhdunarodnuiu ko-  
missiu snega i L8da k XIII General'noi Assamblee Mezhdu-  
narodnogo geodezicheskogo i geofizicheskogo soiuza. Mo-  
skva, AN SSSR, 1963. 109 p. (MIRA 17:3)

1. Akademiya nauk SSSR. Mezhdovedomstvennyy geofizicheskiy  
komitet. 2. Predsedatel' sektsii glyatsiologii Sovetskogo  
geofizicheskogo komiteta (for Avsyuk). 3. Byuro sektsii  
glyatsiologii Sovetskogo geofizicheskogo komiteta (for Grave,  
Kotlyakov, Peschanskiy, Tushinskiy).

TUSHINSKIY, G.K., MALINOVSKAYA, N.M.

Position of the "365 level" over the territory of the U.S.S.R.  
and its relation to the glaciation. Inform.sbor.o rab.Geog.  
fak.Mosk.gos.un.po Mezhdunar.geofiz.godu no.9t5-9 '62.  
(MIRA 16:2)

(Glaciology) (Snow line)

TUSHINSKIY, G.K.

Ice depth of Mount Elbrus. Inform.sbor.o rab.Geog.sak.Mosk.gos.un. po  
Mezhdunar.geofiz.gosp no.5:6-9 '60.  
(Elbrus, Mount—Ice)

TUSHINSKIY, G. K.

Features of mountain glacier areas and problems in applied  
glaciology. Inform. sbor. o rab. Geog. fak. Mosk. gos. un.  
po Mezhdunar. geofiz. godu no.8:7-26 '62.  
(MIRA 16:1)

(Glaciers)

DAVYDOVA, Mariya Ivanovna; KAMENSKIY, Aleksandr Iosifovich; TUSHINSKIY,  
Georgiy Kazimirovich; FISHCHEVA, T.V., red.; ZAYTSEVA, K.F.,  
red. kart; KORNEYEVA, V.I., tekhn. red.

[General field practice in physical geography] Kompleksnaya  
polevaia praktika po fizicheskoi geografii; posobie dlia  
studentov III i IV kursov geografo-biologicheskikh fakul'te-  
tov pedagogicheskikh institutov. Moskva, Uchpedgiz, 1962.  
(MIRA 16:7)  
147 p.  
(Physical geography---Study and teaching)

TUSHINSKIY, Georgiy Kazimirovich, prof.; ABRAMOV, L.S., red.;  
KONOVALYUK, I.K., mladshiy red.; GOLITSYN, A.V., red.  
kart; VILENSKAYA, E.N., tekhn. red.

[Glaciers, snow, and avalanches in the Soviet Union] Led-  
niki, snezhniki, laviny Sovetskogo Soiuza. Moskva, Geog-  
rafgiz, 1963. 310 p. (MIRA 16:4)  
(Snow) (Avalanches) (Glaciers)

TUSHINSKIY, G.K.

Glacial retreat of Mount Elbrus and its dynamics. Inofra-sbor.o rab.  
Geog. fak. Mosk. gos. un. po Mezhdunar. geofiz. godu no.2:117-166 '58.  
(MIRA 15:10)  
(Elbrus, Mount—Glaciers)

SULAKVELIDZE, G.K., prof., red.; TUSHINSKIY, G.K., prof., red.;  
MAKHOV, A.G., red. izd-va; BARGI, T.M., tekhn. red.;  
KUMUKOVA, S.S., tekhn. red.

[Transaction of the Elbrus Alpine Expedition] Trudy El'brus-  
skoy vysokogornoj ekspeditsii, 1934.. Nal'chik, Kavardino-  
Balkarskoe knizhnoe izd-vo. Vol.1(4). [Snow, avalanches,  
and the use of snow in the national economy] Sneg, laviny i  
primenenie snega v narodnom khoziaistve (Materialy II Vse-  
soiuznoi mezhvedomstvennoi konferentsii, posviashchennoi  
voprosam snezhnogo pokrova). 1959. 306 p. (MIRA 15:11)

1. El'brusskaya vysokogornaya ekspeditsiya, 1934..  
(Snow)

S/148/62/000/008/004/009  
E071/E435

AUTHORS: Edel'man, F.L., Tushinskiy, L.I.  
TITLE: Resistance of iron-aluminium alloys to scale formation  
PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no.8, 1962, 119-127

TEXT: The investigation was carried out in order to obtain data on the resistance to the formation of scale for a large group of iron-aluminium alloys containing various amounts of carbon (0.05 to 0.45), aluminium (10.6 to 31.2) and silicon (0.03 to 0.52). Some of the alloys were modified with calcium. The method of preparation of the alloys and specimens as well as the method of testing were described in an earlier paper. The specimens were retained in a furnace at 800 and 1000°C for 1, 2, 5, 10, 25, 50 and 100 hours and at 1100°C for 1, 2, 5 and 10 hours. In addition some data on the initial stages of oxidation of the alloys at 1000°C were obtained. Depending on the temperature of oxidation there are various optimal compositions of iron-aluminium alloys:

Card 1/3

Resistance of iron-aluminium ...

S/148/62/000/008/004/009  
E071/E435

	Optimum content of Al in alloy, %	Resistance to scaling at a temperature, °C
not less than	15 - 16	up to 800
not less than	18 - 22	800 - 1000
not less than	22 - 25	1000 - 1100

The mechanism of oxidation of the alloy is similar to that of iron-chromium-aluminium alloys, i.e. in the first stage simultaneous oxidation of iron and aluminium takes place with the formation of an oxide film, probably of the spinel type. On further retention or with increasing temperature, the process of alumothermal reduction of iron oxides in the film takes place. The composition of the film approaches that of aluminium oxide. All iron-aluminium alloys with an optimal or higher aluminium content for the given temperature had a dense, non-scaling oxide

Card 2,3

Resistance of iron-aluminium ...

S/148/62/000/008/004/009  
E071/E435

film. Conclusion: iron-aluminium alloys in the cast state have a high resistance to scaling, comparable with that of a number of highly alloyed steels and alloys. The protective oxide film is dense and thin. The best resistance to scaling can be obtained in low carbon alloys (less than 0.1% C and 17 to 22% of Al), modified with 0.1 to 0.2% of calcium. The parabolic law is applicable to high temperature (above 800°C) oxidation of iron-aluminium alloys on the basis of which the main constants of the oxidation process can be calculated. There are 7 figures and 3 tables.

ASSOCIATION: Növöibirskiy elekrotekhnicheskiy institut  
(Novosibirsk Electrotechnical Institute)

SUBMITTED: July 7, 1961

Card 3/3

(A) L 11783-66 EWT(m)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) JD/RW

ACC NRE	AP6001687	SOURCE CODE:	UR/0148/65/000/012/0114/0115
AUTHOR:	Tushinskiy, L. I.; Tushinskaya, K. I.; Stenin, S. I.; Tikhomirova, L. B.	44,55	44,55
ORG:	Novosibirsk Electrotechnical Institute (Novosibirskiy elektrotekhnicheskiy institut)	44,55	44,55
TITLE: Strengthening of high-manganese steel with combined thermomechanical treatment		1/4	51 B
SOURCE: IVUZ. Chernaya metallurgiya, no. 12, 1965, 114-115			
TOPIC TAGS: steel, manganese steel, manganese containing steel, austenitic steel, steel thermomechanical treatment, high temperature treatment, low temperature treatment, combined treatment			
ABSTRACT: Strengthening of high-manganese steel G13 [0.9—1.4% C, 11—14% Mn] by combined high-temperature <u>thermomechanical treatment</u> (HTMT) and low-temperature thermomechanical treatment (LTTMT) has been investigated. Forged bars 10 x 10 x 60 mm were annealed at 1050C and rolled in one pass with 45% reduction, cooled to 370C (HTMT), rolled in one pass with 10% reduction, and water quenched. The HTMT caused the fragmentation of austenite grains and LTTMT brought about additional fragmentation and slips within grains. After combined heat treatment, the steel had a tensile strength of 129.5 kg/mm <sup>2</sup> , a yield strength of 74.5 kg/mm <sup>2</sup> , a hardness of 35 HRC, an elongation of 33.5%, and a reduction of area of 30.5% compared to 104 kg/mm <sup>2</sup> , 44.7 kg/mm <sup>2</sup> , 35 HRC, 53.3%, and 37.5% for the annealed steel and Card 1/2			
UDC: 669.15-194:669.74-15			

L 11783-66

ACC NR: AP6001687

115 kg/mm<sup>2</sup>, 43 kg/mm<sup>2</sup>, 17 HRC, 53.2%, and 36.5% after HTTMT. The additional increase of tensile strength and hardness after LTTMT indicates that plastic deformation at 370C caused the essential change in structure and properties, not only in the surface layers, but in the whole volume of the specimens. Despite the decrease in ductility, the steel can be used under conditions of active wear and impact loads. Orig. art. has: 2 figures and 1 table. (WW)

SUB CODE: 11/ SUBM DATE: 20Jun64/ ORIG REF: 002/ ATD PRESS: 418 0

HW

Card 2/2

ACCESSION NR: AP4017762

S/0148/64/000/002/0131/0139

AUTHOR: Edel'man, F. L.; Tushinskiy, L. I.

TITLE: The structure of Fe-Al alloys

SOURCE: IVUZ. Chernaya metallurgiya, no. 2, 1964, 131-139

TOPIC TAGS: iron aluminum alloy, alloy structure, macrostructure, microstructure, annealing, K-phase, alpha solid solution, ferrite, graphite, silicon, calcium, iron, aluminum, heat treatment

ABSTRACT: Little is known about the effect of different compositions of Fe-Al alloys on their macrostructures. Therefore, the authors investigated 200-300 g specimens of the following group of Fe-Al alloys: (1) with a low content of additives and a variable Al content; (2) with a variable C and Al content; (3) with a variable Si and Al content; and (4) CaSi-inoculated alloys. Maximum brittleness occurred in group (3). Increased additions of Al and C lead to intensive graphitizing in all groups, and 0.1 to 0.2% Ca refined grain size and caused the formation of equi-axial crystals. Hot ductility was

Card 1/3

ACCESSION NR: AP4017762

found to have increased with tensile strength reaching 51 kg/mm<sup>2</sup> at a 10% elongation per unit length. The microstructure of the specimens was basically composed of Al in Fe alpha-solid solution, with negligible quantities of C and a K-phase. In the light of the current controversy over the effect of the K-phase on mechanical and physical properties, the authors investigated the action of heat treatment on the microstructure of the alloys. Cast specimens were annealed at 1000°C for 100 hours. Hardness was highest in group (2), reaching 395-615 Brinell Hardness (HB) for the alpha-phase and 615-755 for the K-phase. Carbon alloys were appreciably affected and it was found that the quantity and the size of the K-precipitants increased, and the hardness of the alpha-solution decreased by 10-40% and by only 5 to 15% for the K-phase. Carbide hardness amounted to 703-858 Brinell Hardness (HB). In group (3), annealing decreased the number and size of the K-phase grains and carbides. Group (4) displayed less carbide, and with 17-22% Al, numerous lamellar K-phase grains and a carbide phase appeared. All inoculated annealed specimens displayed a lower alpha-phase hardness and a higher K-phase hardness. The authors

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ACCESSION NR: AP4017762

contend that the K-phase is a stabilized superstructure ( $Fe_3Al$ ) with a C content within the 0.01 to 4% range inasmuch as the C content does not affect the quantity of the K-phase while microhardness is affected by composition. The authors recommend a maximum C content of 4.4% in the K-phase which corresponds to the formula of the  $(Fe_3Al)_4C_3$  compound. Orig. art. has: 5 figures, 3 tables and 2 equations.

ASSOCIATION: Novosibirskiy elektrotekhnicheskiy institut (Novosibirsk Electrical Engineering Institute)

SUBMITTED: 31Jul63

DATE ACQ: 12Mar64

ENCL: 00

SUB CODE: ML

NO REF Sov: 010

OTHER: 000

Car 3/3

EDEL'MAN, F.L.; TUSHINSKIY, L.I.

Substructure and shear in the structure of cast alloys. Izv.vys.  
ucheb.zav.; chern.mat. 5 no.6:100-102 '62. (MIRA 15:7)

1. Novosibirskiy elektrotekhnicheskiy institut.  
(Alloys—Metallography)

SOV/137-59-1-1270

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 172 (USSR)

AUTHOR: Tushinskiy, L. I.

TITLE: The Effect of Hydrogen on the Structure and Properties of Stainless Steel (Vliyaniye vodoroda na strukturu i svoystva nerzhaveyushchey stali)

PERIODICAL: Tr. Vost.-Sib. fil. AN SSSR, 1957, Nr 6, pp 86-92

ABSTRACT: The effect of H<sub>2</sub> on mechanical properties ( $\sigma_b$ ,  $\sigma_s$ ,  $\delta$ ,  $\psi$ , and  $a_k$ ), R<sub>B</sub>, and microstructure of Cr-Ni steels of the 18-8 type was investigated. The specimens were saturated with H<sub>2</sub> in autoclaves for a period of 40 hours at a temperature of 500°C and at pressures of 1, 400, and 650 atm. It was established that H<sub>2</sub> sharply reduces the values of  $\delta$  and  $\psi$ , increases the magnitude of  $\sigma_b$  and  $\sigma_s$ , but does not affect the microstructure. It is suggested that the influence of the H<sub>2</sub> on the various properties of steel is attributable to its segregation occurring in separate regions (cavities, intergranular "barrier" layers) owing to diffusion processes which take place at high temperatures and pressures.

T F

Card 1/1

SOV/137-59-1-1263

Translation from: Referativnyy zhurnal. Metallurgiya. 1959. Nr. 1. p. 171 (USSR)

AUTHORS: Tushinskiy, L. I., Revis, I. A.

TITLE: Inoculation of a High-speed Steel (Modifitsirovannye bystroezhushchey steli).

PERIODICAL: Tr. Vost.-Sib. fil. AN SSSR, 1957, Nr. 6, pp. 116-127

ABSTRACT. Investigations of microstructure, red-hardness, and wear resistance during cutting were carried out on two grades of high-speed steel of the following composition: 1) 0.98 - 1.12% C, 4.0 - 4.05% W, 8.05 - 8.15% Cr, and 1.25 - 1.35% V; 2) 0.86 - 0.87% C, 6.75-6.82% W, 8.45% Cr, 0.70 - 0.72% V, and 0.25% B; the steels were inoculated with Li introduced in the form of an Li-Ca alloy (30% Li and 70% Ca) in quantities of 0.025, 0.05, 0.10, and 0.25%. The steels were smelted in a HF furnace with a 5-kg capacity and were then cast into metallic molds 8x30x220 mm in size. Li was found to be a highly active inoculant which refines the grains of high-speed steel and increases its red-hardness and endurance during cutting (by a factor of 3), provided the quantity of the Li-Ca alloy introduced into the steel does not exceed 0.025%. T. F.

Card 1/1

EDEL'MAN, F.L.; TUSHINSKIY, L.I.

Structure of iron-aluminum alloys. Izv. vys. ucheb. zav.;  
chern. met. 7 no.2:131-139 '64. (MIRA 17:3)

1. Novosibirskiy elektrotekhnicheskiy institut.

TUSHINSKIY, L. I.

Dissertation: --"Research Into Low-and Medium-Alloy, High-Speed, Cast Steels." Cand  
Tech Sci, Leningrad Polytechnic Inst, Leningrad 1953.

W-30928

SO: Referativnyy Zhurnal, No. 5, Dec 1953, Moscow, AN USSR (REPRINT)

GORDEYeva, Ye.K.; MARINETS, T.K.; TIKHODKIEV, N.N.; TUSHINSKIY, L.I.

A unit for testing metals for lasting strength and creep in ionized gaseous media. Zav.lab. 21 no.4:437-488 '55 (MLRA 8:6)

1. Leningradskiy politekhnicheskiy institut imeni M.I.Kalinina  
(Creep of metals)(Metals--Testing)(Testing-machines)

SOV/137-58-12-25239

Translation from: Referativnyy zhurnal Metallurgiya, 1958, Nr 12, p 171 (USSR)

AUTHORS: Tushinsky, L. I., Revis, I. A.

TITLE: High-speed Steels for Cast Tools (Bystrorezhushchiye stali dlya litogo instrumenta)

PERIODICAL: Tr. Vost.-Sib. fil. AN SSSR, 1957, Nr 6, pp 93-115

ABSTRACT: An investigation was made of low- and medium-alloy high-speed steels for cast tools. It was established that, when casting into metallic molds with subsequent treatment by cooling and tempering, steels of the following composition (in %) C 0.7, W 6.75, Cr 8.4, and V 0.77 have a service-life expectancy of 145%, whereas steels containing (in %) C 0.97, W 4, Cr 9.07, and V 1.31 have a service-life expectancy of 173% of that of forged high-speed R9 steel. These steels are recommended for cast tools for milling work.

I. B.

Card 1/1

S/128/63/000/001/002/008  
A004/A127

AUTHORS: Tushinskiy, L.I., Tushinskaya, K.I., Smolyakova, L.G.

TITLE: Modifying silumin in pressure casting

PERIODICAL: Liteynoye proizvodstvo, no. 1, 1963, 5 - 6

TEXT: Tests were carried out with the standard AJ 2 (AL2) alloy to find out whether the fine-grained structure obtained in pressure crystallization cannot be refined by modification with surface-active elements. The castings were produced on a type 512 machine at an operating pressure of 150 atm and a mold temperature of 195°C. The following modifiers were used: metallic sodium, its salts, 20% lithium alloy with calcium, aluminum-titanium foundry alloy with 12% Ti. The modifiers were fed into the distributing furnace at a constant temperature of 650°C. An investigation of the casting microstructure revealed the effectiveness of modifying silumin with various addition agents. Surface-active modifiers such as sodium, sodium salts, lithium, change the interrelation between aluminum and silicon. A special structure characterized by the spheroidal shape of crystals was obtained in modifying the alloy with a 0.05% Li-Ca foundry alloy.

Card 1/2

Modifying silumin in pressure casting

S/128/63/000/001/002/008  
A004/A127

In the structure of Ti-modified alloys there are no surplus crystals of silicon and of the  $\alpha$  solid solution. The duration of the modifier action in the molten silumin amounts to from 60 - 70 (metallic sodium) to 5 - 6 hours (titanium). As a result of applying this modification method, the output of serviceable castings increased by 40%, which is mainly due to the refined structure and increased density of the alloy. There are 3 figures.

Card 2/2

S/123/62/000/004/014/014  
A004/A101

AUTHORS: Tushinskaya, K. I., Tushinskiy, L. I.

TITLE: Producing homogeneous eutectics of high-silicon Silumin

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 4, 1962, 20, abstract 4G122 ("Sb. tr. Nauchno-tekhn. o-vo radiotekhn. i elektrosvyazi im. A. S. Popova", 1960, no. 1, 181 - 183)

TEXT: The authors investigated pressure-casting alloys containing 11.7, 12, 13, 14, 15, and 16% Si, which were smelted in graphite crucibles to which a corresponding amount of silicon was added to the eutectic (11.7%) Silumir. The alloy was modified by adding 0.05 and 0.1% Na at 700°C. It was found that the addition of surface-active modifiers essentially alters the interrelation between the constituents in the formation of eutectic alloys. The eutectic point shifts to the right up to approximately 14.0% Si. It is possible to obtain a eutectic structure during the modification of Silumin containing approximately 14.0% Si both in casting into metal and sand molds. Reducing the heterogeneity of the Silumin structure by removing the excess dendrites of the solid solution of silicon in the aluminum, improves the mechanical and technological properties of the alloy. ✓

Card 1/2

Producing homogeneous...

S/123/62/000/004/014/014  
A004/A101

Thus the tensile strength limit, according to test data, increased by some 25%.  
There are 6 figures and 3 references.

L. Yanovskaya

[Abstracter's note: Complete translation]

Card 2/2

TUSHINSKAYA, K.I.; TUSHINSKIY, L.I.

Dependence of the mechanical properties of eutectoid steel on the  
structural state of pearlite. Izv. vys. ucheb. zav.; chern. met.  
4 no.12:130-134 '61. (MIRA 15:1)

1. Novosibirskiy institut inzhenerov transporta i Novosibirskiy  
elektrotekhnicheskiy institut.  
(Steel--Metallography) (Phase rule and equilibrium)

35920  
S/148/62/000/002/007/008  
E073/E535

18.11.50

AUTHORS: Edel'man, F.L., Pokrovskiy, V.V., Tushinskiy, L.I.  
and Dautova, A.I.

TITLE: Stability of alloy steels in molten tin

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya  
metallurgiya, no.2, 1962, 123-124

TEXT: The aim of the work was to determine the stability of various metals and alloys in molten tin at temperatures above 500°C. Specimens made of alloy steels of standard composition, of pure metals (titanium, tantalum and nickel) and of iron-aluminium alloys containing 2.49, 16.11, 18.44, 21.62, 25.76 and 29.36% aluminium, rest Fe were immersed for two hours in molten tin at temperatures between 400 and 1250°C. The degree of dissolution of the metal in the tin was determined by calculation from the difference between the initial and the final contents of the particular material in the tin. Titanium and tantalum proved resistant against dissolution in tin but became brittle at 600°C and above; therefore, they are unsuitable as structural materials under the given conditions. At temperatures up to 1000°C, the

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X

Stability of alloy steels in ... S/148/62/000/002/007/008  
E073/E535

steel IX18HQ<sub>T</sub>(1Kh18N9T) was the most resistant against dissolution and iron-aluminium alloys showed a satisfactory resistance. Above 1000°C, the aluminium alloys containing 16.11, 25.76 and 29.36% Al were more resistant than stainless steel. In view of their cheapness and good technological properties, iron-aluminium alloys are recommended as substitutes for stainless steel in the manufacture of apparatus intended to operate in contact with molten tin. There is 1 table.

ASSOCIATION: Novosibirskiy elektrotekhnicheskiy institut  
(Novosibirsk Electro-technical Institute)

SUBMITTED: March 14, 1961

CARD 8/8

EDEL'MAN, F.L.; TUSHINSKIY, L.I.

Investigation of iron-aluminum alloys. Izv. vys. uchet. zav.; chern.  
met. no.2:128-132 '61. (MIRA 14:11)

1. Novosibirskiy elektrotekhnicheskiy institut.  
(Iron-aluminum alloys)

18.8306

32662

S/126/61/012/005/026/028  
E040/E435

AUTHORS: Edel'man, F.L., Pokrovskiy, V.V., Tushinskiy, L.I.,  
Dautova, A.I.

TITLE: Superstructure and anomalous corrosion resistance

PERIODICAL: Fizika metallov i metallovedeniye, v.12, no.5, 1961,  
778-779

TEXT: The anomalous drop in the corrosion resistance of ferro-aluminium alloys in the temperature interval of 550 to 580°C was investigated on cast ferroaluminium specimens containing 2.49 to 29.36% Al and impurities of C, Si, Mn, S and P in the total quantity of less than 0.5 to 0.8%. The specimens were dissolved in molten O-1 grade tin at various temperatures (up to 1200°C) and the quantity of the dissolved ferroaluminium alloys was determined at the various test temperatures. All specimens were annealed before tests. The data obtained are shown graphically. It was found that a sharp deterioration in the corrosion resistance of ferroaluminium alloys corresponds to the temperature intervals of 500 to 600°C and 1000 to 1200°C. The absolute solubility of the test specimens with various aluminium contents is of the same order for all alloys with the exception of

4

Superstructure and anomalous ...

32662  
S/126/61/012/005/026/028  
E040/E435

those containing 16.11% Al and 25.76% Al. Alloy steels 1X13 (1Kh13), 1X18N9 (1Kh18N9) and 1X18N9T (1Kh18N9T), titanium and nickel tested under identical conditions had a lower corrosion resistance than the ferroaluminium alloys. Nickel was found to dissolve completely in tin at 550°C. An attempt is made to interpret the test data in terms of the previously reported concept of superstructure (Ref.1: Bradley A.I. et al. J. Iron and Steel Institute, v.125, 1932, 339; Ref.2: Sykes C. et al. J. Iron and Steel Inst., v.131, 1935, 225; Ref.3: Bradley A.I. et al. J. Iron and Steel Inst., v.141, 1940, 63) which affects the corrosion resistance properties of ferroaluminium alloys in the temperature interval of the order-disorder transformation (550 to 580°C) and arises in consequence of the disappearance of domain structure of ordered alloys and the development of lattice defects and their diffusion in crystals. The most probable cause of the observed reduction in the corrosion resistance of the alloys is the appearance of lattice defects at the instant when disorder sets in, which leads to a weakening of the interatomic bond forces. There are 1 figure and 6 references: 3 Soviet-bloc and 3 non-Soviet-bloc. The three references to English language publications are quoted in Card 2/3

32662

S/126/61/012/005/026/028  
E040/E435

Superstructure and anomalous ...

the text.

ASSOCIATION: Novosibirskiy elektrotekhnicheskiy institut  
(Novosibirsk Electrotechnical Institute)

SUBMITTED: March 13, 1961

X

Card 3/3

TUSHINSKIY, L.I.; TUSHINSKAYA, K.I.; SMOLYAKOVA, L.G.

Reducing the heterogeneity of eutectic alloys by inoculation. Izv.  
vys.ucheb.zav.; chern.met. 4 no.6:125-128 '61. (MIRA 14:6)

1. Novosibirskiy elektrotekhnicheskiy institut i Novosibirskiy  
institut inzhenerov zheleznodorozhnogo transporta.  
(Alloys—Metallography)

S/137/62/000/002/078/1  
A096/A101

AUTHORS: Tushinskaya, K. I., Tushinskiy, L. I.

TITLE: Obtaining homogeneous eutectics of high-silicon Silumin

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 2, 1962, 48, abstract 2130<sup>R</sup>  
("Sb. tr. Nauchno-tekhn. o-vo radiotekhn. i elektronicheskogo in-ta A. S.  
Popova", 1960, no. 1, 181 - 183)

TEXT: Investigations were made with alloys containing 11.7; 12; 13; 14;  
15 and 16% Si. The addition of surface-active modifiers changes substantially  
the correlations of the components during the formation of an eutectic alloy.  
The location of the eutectic point is shifted to the right hand side, approximate-  
ly up to 14.0%. It is possible to obtain an eutectic structure during the modi-  
fication of Silumin, containing 14.0% Si, when casting in both metallic and sand  
molds. A reduced heterogeneity of the Silumin structure by removing excess den-  
drites of solid solution & raises mechanical and technological properties of the  
alloy. For instance,  $\sigma_b$  increases by about 25% during tension, according to the  
experimental data.

T. Rumyanseva

[Abstracter's note: Complete translation]

Card 1/1

| 8.115| 4016 1418 1416 1413

S/148/61/000/002/011/011  
A161/A133

AUTHORS: Edel'man, F. L., Tushinskiy, L. I.

TITLE: An investigation of iron-aluminum alloys

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Chernaya metallurgiya, no. 2, 1961, 128 - 132

TEXT: Nonoxidizing high-temperature alloys used at present are high-alloy steel and special alloys (with Ni, Mo, Co or other base), or low and medium-alloy steel and cast iron (mostly with Cr, Ni, Si, etc) that are oxidation-proof at 800 - 900°C. The described investigation of low-carbon Fe-Al alloys has been conducted for the reason that this is the cheapest element combination that is oxidation-resistant at 800 - 1,100°C. The alloys were prepared by mixing molten low-carbon iron with 2.49 to 29.36% Al. The initial materials were: aluminum with 0.00% Si, 0.002% Cu, and 0.17% Fe, and iron with 0.08% C, 0.15% Mn, 0.22% Si, 0.024% S, 0.018% P and 0.05% Cr. The iron was melted in an acid induction furnace with fluid slag (glass scrap); 0.15% (weight per cent) Al, was added towards the end of the melting. The Iron temperature measured during pouring was 1,500 - 1,530°C. The average weight of a melt was 1 kg. Aluminum was melted in a crucible,

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27040

S/148/61/000/002/011/011

A161/A133

An investigation of iron-aluminum alloys

overheated to 750°C, and mixed with iron poured into the crucible using a steel rod. All specimens with below 16.11% Al had coarse disoriented crystals and 1 mm deep finely grained skin. Alloys with 16.11 - 29.36% Al had a zone of acicular crystals reaching from the fine-grained skin to the axis of the ingots, and the ingots broke from relatively slight blows. The microstructure was examined in cast specimens annealed at 1,000°C for 5 h. It was a monophase solid solution in metal with up to 10.6% Al, and biphasic structure in metal with more Al, with the laminar second phase on the background of a light polyhedral component ( $\beta$ ). The lamellas were often on the boundaries of solid solution grains, and the size of lamellas was different. They were largest in alloys with 16.11 - 29.36% Al. The lamellas coagulated after 5 h annealing. The microhardness of the largest lamellas was lower than that of the base, and the difference was largest in metal with 29.36% Al. The hardness was different in different spots. The highest hardness was obtained in alloys with 22.37% Al; 5 h annealing at 1,000° reduced the hardness by 30 - 70 Brinell units in all compositions. The machinability was estimated by drilling and corresponded to the hardness. Comparing to four annealed steel grades, most of the tested alloys except for the composition with 29.36% Al were better machinable than the heat-resistant 2X13 (2Kh13) steel. The high-temperature oxidation resistance was tested in an oxidizing atmosphere of a furnace and

Card 2/3

An investigation of iron-aluminum alloys

S/148/61/000/002/011/011  
A161/A133

measured with analytic scales. The scale on alloys with below 10.60% Al was black, porous and easily separating, but on other alloys it was very dense, pink, and stuck to the surface. In the open air the pink film rapidly covered with a loose white matter (apparently aluminum hydroxide). The resistance to scaling at 1,000°C was somewhat higher on specimens with the cast skin left on than on specimens of same metal composition after turning. The Fe-Al alloys with above 18.44% Al had higher heat resistance than 1Kh13 steel and several times higher than the silicon and aluminum cast iron heat resistance indicated in some publications. [Essentially full translation]. There are 5 figures, 1 table and 5 Soviet-bloc references.

ASSOCIATION: Novosibirskiy elektrotekhnicheskiy institut (Novosibirsk Elektrotechnical Institute)

SUBMITTED: May 4, 1960

Card 3/3

181210 2408 S/148/61/000/006/009/013  
26585 E111/E480

AUTHORS: Tushinskiy, L.I., Tushinskaya, K.I., Smolyakova, L.G.

TITLE: Reducing the heterogeneity of eutectic alloys by modifying treatment

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1961, No.6, pp.125-127

TEXT: The mechanical properties of eutectic alloys may be adversely affected by the presence of large grains of the component phases. In the case of the Al-Si eutectic, its UTS can be reduced to 13 - 14 kg/mm<sup>2</sup> by the formation of large grains of brittle silicon. The formation of fine eutectic and the absence of large silicon grains can be ensured by the introduction of sodium (metallic or combined) in the melt. As a result of this modifying treatment, the UTS of the alloy increases to 16 - 17 kg/mm<sup>2</sup>. However, a modified alloy of the nominally eutectic composition contains large primary grains of the  $\alpha$  phase (Si-rich, Al-base solid solution). It would appear, therefore, that the modifying treatment does not in this case ensure homogenization of the alloy, since the elimination of coarse silicon grains is attained at the

Card 1/3

26585

S/148/61/000/006/009/013

X

Reducing the heterogeneity ...

E111/E480

cost of the appearance of the  $\alpha$  primaries; the object of the investigation described in the present paper was to explore the possibilities of producing a modified Al-Si alloy with a truly eutectic structure and to study the effect of structure on the mechanical properties of the alloy. In preliminary experiments, the structure of alloys containing 11.7 to 16% Si and 0.12% Fe, modified with 0.1% Na, and cast into graphite or metal moulds under equal temperature conditions was examined. The results indicated that, irrespective of the experimental conditions employed, the eutectic point of the modified Al-Si system is at 14% Si. In the next series of experiments, the industrial Al-Si alloy АЛ 2 (AL2) containing 11.7% Si was used as the basis of preparing a series of experimental alloys with varying Si content. The alloys were melted in an electric crucible furnace of 80 kg capacity, in the following manner: a predetermined quantity of the AL2 alloy was added to a molten Si-rich master alloy; the melt was allowed to cool to 700°C, purified by introducing 0.2% zinc chloride and modified with 0.1% Na; after holding for 10 minutes at 700°C, the alloy was cast into sand and metallic moulds. The results can be  
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Reducing the heterogeneity ...

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summarized as follows: (1) The structure of unmodified alloys with more than 11.7% Si shows primary grains of silicon. The crystallization of silicon is prevented by the addition of sodium which, however, causes the formation of dendrites of the  $\alpha$  phase. (2) The tendency to the formation of primary grains of either component is suppressed by introducing sodium to the 14% Si alloy which solidifies in the form of a fine eutectic. This alloy had a UTS of 21.2 kg/mm<sup>2</sup> and an elongation of 9% as compared with a UTS of 17.0 kg/mm<sup>2</sup> and elongation of 7.1% of the modified 11.7% Si alloy. There are 4 figures, 2 tables and 2 references: 1 Soviet and 1 non-Soviet.

ASSOCIATIONS: Novosibirskiy elektrotekhnicheskiy institut  
(Novosibirsk Electrotechnical Institute)  
Novosibirskiy institut inzhenerov zheleznodorozhного  
transporta (Novosibirsk Institute of Rail Transport)

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ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Candidate of Technical Sciences, presented to the Gruz. politekhn. in-t (Georgia Polytechnic Institute), Tbilisi, 1958

ASSOCIATION: Gruz. politekhn. in-t (Georgia Polytechnic Institute), Tbilisi

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